In the Specification:

Please amend the specification to read as follows. A marked-up copy of the specification changes is provided in the Attachment. No new matter is added.

1. Please amend the paragraph beginning at page 3, line 14 to read as follows.

A1

According to an exemplary embodiment of the present invention, an optical switch includes a first waveguide holding member and a second waveguide holding member disposed on a substrate. The first waveguide holding member moves relative to the second waveguide holding member. A movement guiding member guides the motion of the first waveguide holding member.

2. Please amend the three consecutive paragraphs beginning at page 8, line 8 to read as follows.

A2

Turning to Fig. 2, an exploded view of an optical switch 200 according to an exemplary embodiment of the present invention is shown. A substrate 201 illustratively includes longitudinal grooves 203 and transverse grooves 202. The longitudinal grooves 203 and transverse grooves 202 are adapted to receive positioning members 204. The positioning members 204 are illustratively microspheres or other suitable sphere-shaped objects. The positioning members 204 are disposed between the longitudinal grooves 203 and pits 207 disposed in second waveguide holding member 206. Positioning members 204 are also positioned between transverse grooves 202 and pits 208 disposed in first waveguide holding member 205. As can be readily appreciated the longitudinal and transverse grooves 201 and 202 of the substrate and the 208, 207 pits on the first and second waveguide holding members 205 and 206, respectively are on opposing surfaces thereof.

Illustratively, transverse motion of the first waveguide holding member 205 is achieved by motion of the positioning members 204 in grooves 202. The positioning members 204 are constrained by pits 208. Likewise, longitudinal motion of second waveguide holding member 206 is achieved through the motion of positioning members 204 in longitudinal grooves 203. The positioning members 204 are constrained in pits 207 in the second waveguide holding member 206.

As described in more detail above, the longitudinal motion may be used to adjust gap spacing 209 between the first waveguide holding member 205 and the second waveguide holding

member 206. Transverse motion of the first waveguide holding member 205 may be used to achieve switching between waveguides 210 and 211. To this end, switching is achieved by selectively coupling/decoupling waveguides 210 disposed in first waveguide holding member 205 with waveguides 211 disposed in second waveguide holding member 206. Finally, it is of interest to note that waveguides 210 and 211 may be disposed on the lower surfaces of the first and second waveguide holding members 205 and 206, respectively. They may be held in v-grooves (not shown), for example. Moreover, the waveguides 210 and 211 may be disposed on the top surfaces of the waveguide holding members 205 and 206, respectively. Finally, waveguides 210 and 211 may be disposed within waveguide holding members 205 and 206, thereby being integral parts thereof.

A2

3. Please amend the three consecutive paragraphs beginning at page 10, line 1 to read as follows.

A3

Positioning members 307 are disposed between longitudinal grooves 303 in substrate 301 and grooves 308 disposed in second waveguide holding member 309. Positioning members 307 are illustratively cylindrical-shaped rod elements which enable the longitudinal motion (x-direction) of first waveguide holding member 306. Illustratively, positioning members 307 may be sections of optical fiber or micromachined rods. Moreover, positioning members may be glass, metal or ceramic. Similar to the illustrative embodiment of FIGS. 1 and 2 the longitudinal motion of second waveguide holding member 309 enables the adjustment of the gap spacing 310 between the first waveguide holding member 306 and the second waveguide holding member 309 to enable coupling of optical fibers 311 and 312.

In the illustrative embodiments of FIGS. 2 and 3, the grooves 202, 203, 302, 303 and 308 are illustratively v-shaped grooves. The pits 207, 208 and 305 are illustratively inverted pyramidal-shaped pits. The grooves and pits are formed by illustrative techniques described below. Finally, in the illustrative embodiments of FIGS. 2 and 3, first waveguide holding members 205 and 306 and second waveguide holding member 206 each include four pits which constrain positioning members 204 and 304. As can be readily appreciated, at least three pits are required for stability and motion constrain. Other numbers of pits and positioning members may be used in keeping with the present invention. Finally, grooves 202, 203, 302, 303 and 308 and pits 207, 208 and 305 may be lined with a suitable material to reduce wear and/or friction.

The inverted pyramidal pits and grooves may be formed by anisotropic wet etching of a monocrystalline material. Illustratively, monocrystalline material may be selectively etched according to known techniques. The surfaces of the inverted pyramidal pits are along well-defined principle planes of the monocrystalline material. One such known technique for anisotropic etching of monocrystalline material may be found in U.S. Pat. No. 4,210,923 to North, et al., the disclosure of which is specifically incorporated by reference herein. Of course, other known etching techniques may (wet or dry) be used to form the pits and grooves. Moreover, other materials may be used for the substrate and first and second waveguide holding members. These include, but are not limited to, glass, quartz, metal or plastic. The grooves and pits may be formed therein by known techniques.

A3

4. Please amend the paragraph beginning at page 11, line 17 to read as follows.

A4

Fig. 4 shows an optical switch 400 according to an illustrative embodiment of the present invention. A substrate 401 has transverse v-grooves 402 disposed therein. The substrate 401 further includes longitudinal v-grooves 403. A first waveguide holding member 404 includes first waveguides 405. The waveguides 405 may be disposed on top of the first waveguide holding member 404; on the bottom of first waveguide holding member 404; or within the first waveguide holding member 404. A second waveguide holding member 406 includes second waveguides 407. The second waveguides 407 may be disposed on a top surface of second waveguide holding member 406; a bottom surface of second waveguide holding member 406; or within the second waveguide holding member 406. Waveguides 405 and 407 are illustratively optical fibers. However, waveguides 405 and 407 may be planar waveguides. In the illustrative embodiment of Fig. 4, first positioning members 408 are disposed in pits 409 in the first waveguide holding member 404. Likewise, second positioning members 410 are disposed in pits 411 in the second waveguide holding member 406.

5. Please amend the two consecutive paragraphs beginning at page 13, line 1 to read as follows.

A5

Illustratively, a movement guiding member may comprise a second positioning member 410 disposed between a pit 411 and a transverse groove 402. The transverse motion of waveguides 407 relative to waveguides 405 enables the selective coupling/decoupling of waveguides. This facilitates the switching of a signal from one waveguide to another. For

example, an optical signal may be traversing waveguide 413 of the first waveguide holding member 404. This waveguide may be coupled to waveguide 414 disposed in second waveguide holding member 406. As can be readily appreciated, movement of the second waveguide holding member 406 in either the +y-direction or the -y-direction may uncouple waveguide 413 from waveguide 414. Movement in the +y-direction, for example of a predetermined distance may enable coupling of the optical signal traversing waveguide 413 into waveguide 415. As such, coupling of the optical signal is "switched" from waveguide 414 to waveguide 415.

A5

In the exemplary embodiment, waveguides 405 and 407 each comprise a row of three waveguides. Of course, this is for purposes of illustration, and more or fewer waveguides may be used. Moreover, as can be readily appreciated, waveguides 405 of the first waveguide holding member 404 may be a linear array (a row) or a matrix of a suitable number of rows and columns of optical waveguides. Likewise, optical waveguides 407 of the second waveguide holding member 406 may also be a linear array (a row) or a matrix having a suitable number of rows and columns. Moreover, the pitch between waveguides 405 may be the same or different than that of waveguides 407. As such, sophisticated switching schemes may be realized through the transverse motion of the second waveguide holding member 406 relative to the first waveguide holding member 404.

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6. Please amend the two consecutive paragraphs ~~beginning at page 14, line 8 to read as follows.~~

A6

The motion of the positioning members 504 in the transverse grooves 502 enables the transverse motion (y-direction) of the second waveguide holding member 506 relative to the first waveguide holding member 507. The transverse motion enables the selective coupling/decoupling of optical waveguides 508, 509 and 510 to waveguides 511, 512 and 513, respectively. Transverse motion of the second waveguide holding member 506 would change this coupling, enabling a switching action.

In the illustrative embodiment of Fig. 5, positioning members 514 are disposed in pits 515 in the second waveguide holding member 507. As can be readily appreciated, the engagement of the positioning members 514 within the longitudinal grooves 503 in the substrate 501 enables longitudinal movement (x-direction) of the second waveguide holding member 507. According to the illustrative embodiment of Fig. 5, the second waveguide holding member 507 may have an endface 516 which is polished. The gap spacing 517 may be accurately determined by